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ABSTRACT

A paradigm for learning economic concepts based on cognitive development and learning theory is offered as a guideline for teaching and research. Discussion is divided into two sections. The first section establishes the model's theoretical framework, which is based on two propositions. The first of these is that economic knowledge is not a fixed category but a continuum of three knowledge types. These are: Socially Egocentric Knowledge, experiential knowledge based on a child's exposure to normal economic interactions; Socially Relevant Knowledge, based on wider social awareness of economic events; and Expert Knowledge, grounded in an abstract-theoretical understanding of economic events. The second proposition is that there are three age-correlated levels of economic concept attainment, labled as Concrete-Definitional, Functional-Experiential, and Abstract-Forral. By combining these 2 propositions, a 9-part structure of the economic learning process is formulated. This structure is analyzed, part by part, in section 2. Each part is identified and its learnable concepts, constraints, and corresponding age groups are elaborated. A chart clarifies and summarizes the model. (LP)

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A THEORETICAL MODEL OF CONCEPT LEARNING IN ECONOMICS

Revised Edition

by

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The growth and development of K-12 curricula in economic education has been phenomenal since the directives of the National Task Force Report on Economic Education in 1961. The monumental efforts of numerous individuals have resulted in the impressive work of the Developmental Economic Education Project(DEEP) and the Master Curriculum Guide. The continuous effort of economic educators to upgrade and build on past efforts has now led to a new stage of revision and reevaluation: The interface with other disciplines in order to develop more effective and efficient systems of teaching economic concepts (to develop an optimal path of Economic Education).

The question, what relevance conceptual development theory has for the learning of economic concepts, has become a topic of great interest to economic educators as evidenced by the Joint Council for Economic Education (JCEE) sponsorship of the recent National Symposium, Learning Theory: Implications for Economic Education.

The main objective of this paper is the development of a theoretical and exploratory set of propositions and a model concerning the learning of economic concepts. The model, based on an eclectic set of existing theory and research in the field of Cognitive Development and Learning Theory, is envisioned as a guide to further thinking and research. In all probability, the suggested model will be questioned and modified, on the basis of results of continuing economic education research. If the model generates discussion, change, and evaluation of the nature and efficient teaching of economic concepts, it will have served its purpose.

LIMITATIONS OF THE MODEL

The development of a learning theory based model for the teaching of economic concepts is constrained for several reasons. First, the lack of a general paradigm of inquiry has limited the usefulness and extension of past research for the development of a conceptual framework for teaching economics. Because of this, the empirical work in this area is both scarce and sporatic (see Shug, 1981 for a review of historic empirical work), though more current research (Armento, 1982, 1982a; Fox, 1978; Lephardt, 1982; Shug 1980) coupled with the support of the JCEE is an encouraging sign for the rectification of this problem. Second,in the context of learning theory, the nature of economic concepts (e.g., hierarchical ordering, organizing concepts, abstractness) and economic knowledge (e.g., Logico-mathematical, Social Arbitrary, Physical) have not been systematically defined. Armento (1982a) and the National Symposium Speakers (1982) (Armento, Phillips, Voss, and Wittrock) have indicated an urgent need for a substantive inquiry into the salient and defining characteristics of economic knowledge and concepts. This "defining process" is viewed as a necessary prerequsite for the development of a more generalized learning theory based introduction of economic concepts in the K-12 curriculum. A third limitation stems from a continuing controversy in the domain of cognitive development, particularly in the stage-related cognitive capabilities of children. Numerous researchers (Brown and Desforges, 1977; Bruner, 1964; Case, 1974, 1978; Gelman, 1978) have posited that the seemingly limited and invariate acquisition and assimilation of concepts (based on Piagetian interpretations) are not evidenced under differing experimental conditions. Furthermore, it has been argued that individual concepts may be acquired at different levels of understanding and usage (Bruner, 1973; Klausmier, Ghatala

and Frayer, 1974) suggesting the need to remain open to a more flexible interpretation of economic concept acquisition.

The controversies in the domain of cognitive development and learning theory are all possible impediments to the development of a model of economic concept acquisition if we simply attempt to utilize an existing psychological theory in economic education. What is evident is the need to propose and empirically test a more general model of concept acquisition by delineating those aspects of the various theories which are germain to the particular nature of economic concepts.

The fourth, and perhaps most disconcerting constraint, emanates directly from the discipline of economics. Where, once past the fundamental problem of scarcity, and the postulates of rational behavior, the interpretation, emphasis, and defining characteristics of economic concepts, principles, laws, and theoretical propostions (both micro- and macro) are open to considerable debate and disagreement (Buchanan, 1966; Machlup, 1966)[1]. In addition, the question of whether the professional economists' understanding of economic knowledge is a necessary condition for functional economic understanding by the general citizenry has not been fully addressed.[2].

The development of a theoretical model is obviously limited if one considers the preceding discussion of the contraints faced in this area. However, a tentative theoretical model is a necessary step if we hope to develop and research a more efficient methodology of economic concept introduction in the K-12 curricula. A theoretical model is proposed in four parts: (1) the nature of economic knowledge; (2) the levels of economic concepts; (3) the age-implied introduction of concepts based on the model; and (4) a summary and conclusions.

THE NATURE OF ECONOMIC CONCEPTS

What is the distinct nature of economic concepts? Is there a possible continuum from socially egocentric to a more abstract expert definition and understanding of economic knowledge? Is there a "functional set" of economic concepts? Is there a hierarchical set of concepts, within which the framework for introducing a concept is dependent not only on the nature of economic knowledge, but also on the developmental capabilities of the learner?(3)

This is a sampling of the questions that must be addressed in the search for a comprehensive and sound economic education curriculum. But it is not necessary to embark on a "random walk" of empirical work if we approach our inquiry from a theoretical paradigm. The first step in the process is in defining the nature of economic knowledge.

CLASSIFICATION OF ECONOMIC KNOWLEDGE

Piagetians have classified knowledge into three basic categories: Physical Knowledge; Logico-Mathematical Knowledge,and Social Arbitrary Knowledge. Identification of the categories of knowledge is based on the assumption that different knowledge is acquired from different operations and, that different types of knowledge are subject to reinforcement of learning from different sources.[4] Table 1 presents a concise summary of the "knowledge types."

Table 1

THREE TYPES OF KNOWLEDGE

	Physical	Logical-Mathematical Knowledge	Social-Arbitrary Knowledge
Defined	knowledge about the physical properties of objects	abstract knowledge	knowledge made by people
How Acquired	discovered by actions on objects; objects are the source	invented from actions on objects actions are the source	obtained from actions on and interactions with others; people are the source
Reinforcer	objects	objects	other people
Examples of Areas of Knowledge	size, color, texture, thickness, taste, sound, flexibility, density	number, mass, area, volume, length, class, order, time, speed, weights	language, moral rules, values, culture, history symbol systems

Source: Wadsworth, 1978, p. 55

It would seem that economic knowledge would best fit the category of Social Arbitrary knowledge. Many economic concepts have been "invented" to describe the actions and interactions of individuals in their efforts to maximize profit. Money, taxes, banking systems are all obvious human inventions. However, the task of categorizing is contiuum of categories, rather than being fixed in a certain knowledge type. The potential continuum of economic knowledge most likely ranges from socially apparent knowledge (basically learned from interaction with other people) to more complex logico-mathematical knowledge (more generally found in the professional economists' theoretical conceptualization of economic knowledge).

For example, scarcity (a fundamental problem of economics and the pivotal concept for discussing the discipline of economics) is certainly not invented by people; nor can it be discovered by actions on objects (as in physical knowledge). Scarcity can be defined (intuited?) as logico-mathematical knowledge (based on the defining characteristic, "invented from actions...,") when,in conjunction with the concept of unlimited wants (another concept difficult to categorize given Piagetian definitions), the meaning and utility of scarcity becomes apparent from "the action" of choice (rational decision making).

The argument that economic concepts can be defined as a continuum of knolwedge types is supported by the research of Armento (1982), Danzinger (1958), Furth (1980), Kourilsky (1977), Schuessler and Straus (1950), Schug (1980), and Straus (1952). Generally, their research indicates children respond to questions concerning economic events and concepts based on what they had learned by interaction with their economic world. In this sense, their economic conceptualizing is

social arbitrary knowledge. The proposed continuum of economic knowledge, however, goes beyond the typical categorization in that it is partially grounded in the developmental capabilities of children's perception, understanding, and envisionment of economic events.

The categories of this type knowledge would be Socially Egocentric, Socially Relevant, and Expert. Socially Egocentric Knowledge can be generally defined in terms of "perceptible" knowledge. It is the concrete experiential knowledge of the "normal" daily economic interactions to which a child is typically exposed. For example, the use of money in purchasing goods. This type of knowledge must necessarily be reinforced for correct interpretation of the events (Wadsworth, 1978). Furth's (1980) research on children's interpreation of store transactions (exchange) supports this knowledge category; if we note that, once past the perceptible event of putting money in the cash register, children were unsure or incorrect in stating what the storekeeper would do with the money. The idea of paying a supplier, or self payment for wages was beyond perceptible knowledge.

The second category is Socially Relevant Knowledge, defined as a knowledge based not only on the perceptible qualities of economic events, but a wider social knowledge of other concrete events occurring in our economic system that have not necessarily been experienced. A more abstract and generalized sense of the social purpose and mechanism of economic activity is also a defining characteristic of this knowledge category.

The Expert Knowledge Category is defined by the much more complex conditional probabilistic-relational understanding of economic events. Both Bruner (1973) and Piaget (1971) suggest that economic knowledge,

as it pertains to the experts' usage, is highly abstract, mathematical, and probabilistic-relational[5]. This knowledge category is grounded in an empirical, and abstract-theoretical understanding of economic events.

The first proposition can now be stated in regard to economic knowledge:

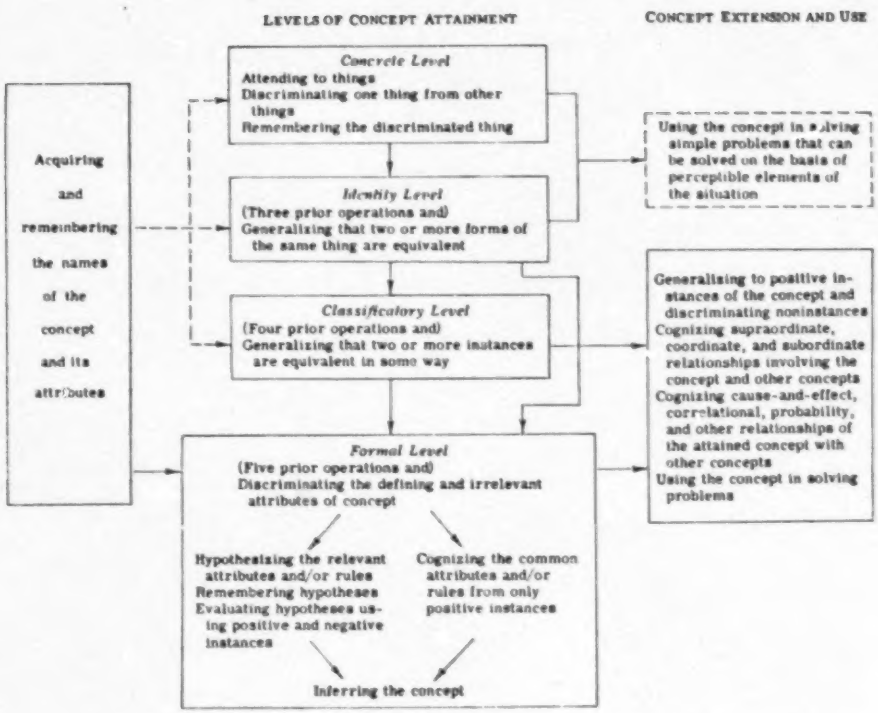
Proposition 1: Economic Knowledge is based on a continuum of knowledge types: Socially Egocentric Knowledge; Socially Revelant Knowledge; and Expert Knowledge.

Before continuing the discussion of the relevance of the three types of economic knowledge it is necessary to describe the proposed levels of economic conceptualization. The purpose of doing this is to enable the presentation of a generalized model of concept learning, based on knowledge types as well as concept attainment levels.

LEVELS OF ECONOMIC CONCEPTUALIZATION

A number of learning theorists (Al-Issa, 1969; Klausmier, Ghatala, and Frayer, 1974; Reed and Dick, 1968; Russel and Saadeh, 1962) have discussed levels of concept attainment associated with age. Klausmier et. al. (1974) postulated ". . . attaining a concept at . . . successively higher levels is a normative pattern . . .", under the conditions that there are "perceptible representations" of the concept starting from early childhood. Their model identified four successive levels: Concrete, Identity, Classificatory, and Formal. Each level is dependent on attainment of the prior level, and each level indicates achivement of a more sophisticated understanding of the concept. Table 2 is a summary of their model. As depicted in the model, concepts attained at the identity and classificatory level can be used to solve simple perceptible problems, while concept attainment in the

Table 2


LEVELS OF CONCEPT ATTAINMENT
CONCEPT EXTENSION AND USE
Acquiring and remembering the names of the concept and its attributes
Concrete Level
Attending to things
Discriminating one thing from other things
Remembering the discriminated thing
Identity Level
(Three prior operations and)
Generalizing that two or more forms of the same thing are equivalent
Classificatory Level
(Four prior operations and)
Generalizing that two or more instances are equivalent in some way
Formal Level
(Five prior operations and)
Discriminating the defining and irrelevant attributes of concept
Hypothesizing the relevant attributes and/or rules
Remembering hypotheses
Evaluating hypotheses using positive and negative instances
Cognizing the common attributes and/or rules from only positive instances
Inferring the concept
Using the concept in solving simple problems that can be solved on the basis of perceptible elements of the situation
Generalizing to positive instances of the concept and discriminating noninstances
Cognizing supraordinate, coordinate, and subordinate relationships involving the concept and other concepts
Cognizing cause-and-effect, correlational, probability, and other relationships of the attained concept with other concepts
Using the concept in solving problems

Source: Klausmier, Ghatala and Frayer, 1974, p.13.

classificatory and formal level indicates the ability to generalize to other instances, relate to other concepts, and solve problems on a more abstract level.

Russel and Saadeh (1962) and Al-Issa (1969) studied the developmental trend in the concrete and abstract definition of words. They categorized the responses of children as concrete, functional ,or abstract. Both researchers found that the definition of a word became more functional and abstract at higher grade levels, implying a developmental trend in verbal understanding.

The research of Armento (1982); Furth (1980); Schuessler and Strauss (1950), Straus (1952), and Schug (1981) also support the idea of developmental understanding of economic concepts by children. In general, all of the researchers found an increased understanding and correct interpretation of economic concepts with increasing age.

It therefore can be argued that there is a developmental pattern of economic concept acquisition. Based on the verbal responses in the research by Armento (1982) Furth (1980), Schuessler and Strauss (1950), Straus (1952), and Shug (1981) it is possible to interpret the responses of children concerning economic concepts as moving from relatively concrete understanding to the more functional and abstract. This would imply three "levels" of concept "attainment" for economic concepts: 1)Concrete-Definitional, 2)Functional-Experiential; and 3)Abstract-Relational.

The Concrete-Definitional level is defined as understanding simplistic, concrete (perceptible) instances of the concept: The Functional-Experiential level includes the prior level of understanding plus a concrete(perceptible), functional usage of the concept in a limited "social" context. The Abstract-Formal level includes the attainment of the two prior levels plus an understanding of the concept's defining instances in a global social context, cognizance of the relational, cause-and-effect, correlational, probabilistic, and evaluative interface with other concepts. This concept level is condusive to basic problem solving.

On the basis of the prior discussion, the second proposition can now be stated:

> Proposition 2: Economic Concepts can be attained on three levels: Concrete-Definitional, Functional-Experiential and Abstract Formal.

It is now possible to present a theoretical model of concept learning in economics based on the acceptance of the preceding propositions concerning the nature of economic knowledge, and the levels of economic concept attainment.

A THEORETICAL AGE-APPROPRIATE MODEL OF ECONOMIC CONCEPT LEARNING

Figure 1 depicts a model of economic concept learning in matrix form combining levels of concept attainment with categories of economic knowledge to clarify more fully the view of concept learning described in this article.

FIGURE 1

Guideline for Age-Related Concept Introduction

LEVEL OF CONCEPT ATTAINMENT	CATEGORIES OF ECONOMIC KNOWLEDGE: SOCIALLY EGOCENTRIC	SOCIALLY RELEVANT	EXPERT
Concrete-Definitional	Limited to the child's viewpoint of his own actions. Instances defining the concept must be perceptible, and simplistic. Primarily definitions. Constraints: language, time perception, memory capacity, social space limited to family, few incentives for correct understanding, poor memory retrieval, lack of connecting concepts, limited experience. Age: 5-6	Aware of wider social space and the importance of the viewpoint of other individuals. Instances defining concept can be perceptible or simulated. A more generalized social awareness facilitates a depth lacking in Socially Egocentric category. Primarily definitional. Constraints: Social space limited to state, regional. Age: 10-11	
Functional-Experiential	Limited to the child's viewpoint of experience and interaction with others. Instances defining the concept must be perceptible and experienced by the child. Awareness of functional usage of the concept is developing. Constraints: language, memory capacity, memory retrieval, small "neighborhood" social space, limited experience. Age: 5-6	Social space expanding to include state, nation, world. Beginning to understand defining and nondefining instances, both verbal and concrete. Perceive value of functional mechanism of economic activity. Motivated to have control of environment. Perceive meaningfulness of economic activity. Beginning awareness of laws and principles. Age: 10-11, 14-15 (depending on concept)	
Abstract-Formal	Limited to the child's experience and interaction with others, but no longer totally from his viewpoint. Instances must be perceptible or readily simulated. Can establish simplistic, perceptible cause-effect, relational and evaluative interfaces with other limited concepts. Constraints: language, memory capacity. Age: 5-6, 10-11 (depending on concept)	Global Social Awareness Instances and non-defining instances may be perceptible, verbal, simulated or hypothetical. Numerous concepts to interface in a probablistic-relational, correlation, cause-effect, hypothesizing manner. Awareness of laws, principles, theories and constraining assumptions. Age: 14-15	All functions of Abstract-Formal/Socially Relevant plus capability of theorizing, representing concept in mathematical language, and highest order of abstractness. Age: 15+

The model is a generalized guideline for introducing economic concepts at the appropriate age to the learner. The age groupings are extrapolated from numerous pieces of research, all basically following the Piagetian periods of Preoperational (2-7 years), Concrete

Operations (7-11 years), and Formal Operations (11-15 years). The categories of economic knowledge provide a general interpretation of the "field of relevant awareness" as the basic constraint imposed upon the kind of concept that might be introduced at each level. The Level of Concept Attainment depict the successive and increasingly sophisticated mastery and developmental stages under the "field" constraints.

In addition, the cells relating to Socially Egocentric Knowledge (at all levels of concept attainment), and the Socially Relevant/Concrete-definitional cell describe the general age-related constraints.

SOCIALLY EGOCENTRIC/CONCRETE-DEFINITIONAL

The first step in operationalizing any concept is to be able to distinguish it from other objects or events (Gagne, 1970). The mastery of a concept at the Socially egocentric/concrete-definitional (SE/CD) level implies discriminating, and remembering the concept label; but mastery is constrained by the child's relatively egocentric perception of events and objects. The primary implication at the level is the importance of understanding when a concept is beyond the child's perceptible or experiential field of awareness, then attempting to teach the concept would be fruitless and inefficient. Anything beyond the perceptible field would most likely be "known" by rote memorization of what the child was told, rather than a "cognizance." This severely limits the teaching of those concepts that either lack perceptible characteristics or function in a domain beyond the realm of the child's normal daily experience.

In addition, the child's understanding will be limited by language and memory. Concepts that can be taught on the SE/CD level would include currency, buyer, seller (storeowner), choice (in a very limited sense), factory, etc. Any concept requiring functional awareness of a wide social space, such as taxes, market, price system is beyond this experiential level.

Other notable aspects of the SE/CD cell pertain to the constraints faced by the learner. Bruner (1973) has discussed concept attainment based on interest, motivation, and expected value for attaining the concepts being taught. Most likely, concepts not readily useful to the child at age 5-6 are not going to be easily learned. Furthermore, at the age of 5-6 years a considerable amount of "vertical learning" is occurring.[6]

In addition, Ward (1977), Wackman and Wartella (1977) argued that a child's limited time perception constrains the learning of economic concepts that require a projection through time. For example, they found saving money clearly related to an understanding of the notion of time, which generally supports Piaget's earlier work involving children's ideas concerning time.

SOCIALLY EGOCENTRAIC/FUNCTIONAL-EXPERIENTIAL

Unlike the Piagetian argument that a child is basically egocentric until approximately seven years, Gelman (1978) reviewed a host of studies indicating that children are capable of perceiving events from a viewpoint other than their own as early as 3 years. The mastery of concepts in the Socially Egocentric/Functional-Experiential (SE/FE) level begin to take on a "functional usage" (beyond a child's immediate viewpoint), though still limited greatly by the perceptible

nature of the defining characteristics of the concept. In this sense, the child is now capable of understanding that economic activity requires functional interactions between people (on an observable level). The role of the storekeeper, and that money is used in exchange (to buy things) can be processed mentally as being a connecting economic interaction. However, if a child cannot concretely act upon the events associated with the concept, then only fragments of the concept will be truly known. The perceptible limits of the of the activity of exchange are basically the reason why a child has no further understanding or reasonable economic explanation of where the money "goes" once it is used in exchange and placed in the cash register (Furth, 1980). The defining instances of what occurs after this point are generally not perceptible to the child. Thus, exposure to a simplistic event such as the storeowner paying the breadman when he delivers the bread would greatly facilitate a functional-experiential understanding of the events of the market.

Many of the limiting constraints of SE/FE level are similar to the earlier stage, although children by this point have developed more sophisticated learning strategies for storing and retrieving information. Also their comprehension of language is expanding.

Most 5- to 6-year-olds can begin to understand the functional usage of concepts such as money, the fact that people work and get paid, and in turn buy goods (the very simplistic part of the circular flow model in terms of stores and families); in some instances scarcity can be introduced, (although, my personal experience is that most children delegate the problem of scarcity to parental or teacher whims rather than the relationship between unlimited wants and scarce resources), as can the use of resources in production.

SOCIALLY EGOCENTRIC/ABSTRACT FORMAL

By the time a child reaches the Socially Egocentric/Abstract -Formal (SE/AF) level of learning (some 5- to 6-year-olds and most 10- to 11-year-olds), the concepts that hae been learned from perceptible instances now begin to take the form of a system of behavior. The beginning of the connecting understanding (horizontal learning) has taken place between separate concepts. The cause and effect between giving money to the storekeeper in exchange for goods is no longer seen solely as a part of a "ritual," but rather as "payment for the goods."

Although still greatly limited in perspective, the other person now becomes relevant. More social experience (even if primarily with peers) given credence to exchange for a purpose. For example, at this point drawing on the perceptible and experiential activity of barter between friends can be a fruitful way to help a child understand and evalute the meaning of exchange on a more formal level.

A child's limited social field of relevance, however, is still a primary constraint. Concepts are limited to an understanding of the I-family: I-friend: I-Local Grovery Store level.

The next set of knowledge type/concept levels is indicative of the social leap that takes place as a child enters adolescence. Many other abilities have developed. Language is more sophisticated, elementary mathematical skills have been acquired, more sophisticated methods of information storage and retrieval have occurred. Augmenting these more sophisticated abilities is the desire to have mastery over one's social environment (a strong motivating force in learning), as well as the increasing number of social experiences and opportunities that can be drawn upon for analysis.

In Piagetian terminology the child is now in the "concrete operational stage" of development where "logical solutions to concrete problems can be solved" (Wadsworth, 1978). The child's maturation of cognitive capabilities now moves beyond the immediate perceptibility of events to a wider socially relevant sphere of understanding.

SOCIALLY RELEVANT/CONCRETE DEFINITIONAL

Having mastered the earlier levels of learning, the child (age 10- to 11-years-old) in the Socially Relevant/Concrete-Definitional(SR/CR) level is ready to learn the more formal definitional language associated with concrete events of our economy. His field of social awareness has expanded to city state and regional affairs; an entirely new vista of economic concepts is open to him. A child can now readily learn from a "simulated" set of instances which can be easily generalized to the "real world."

At this level, the labeling of positive examples—those defining instances of what the characteristics of a concept are—become integral for the functional "pulling together" of the following phase.

My intuitive feeling is that the SR/CD and Socially Relevant/Functional Experiential level of concept learning meld together at some point. It is like learning the names of the parts of an engine before being able to discuss how the engine parts fit together in a cohesive whole.

Concept definitions such as taxes, consumers, suppliers, resources, prices can be delineated, in preparation for putting them into a cohesive system in the next phase.

SOCIALLY RELEVANT/FUNCTIONAL EXPERIENTIAL

In the Socially Relevant/Functional Experiential (SR/FE) level (age 10- to 11-years-olds), the concrete definitions of the prior phase now become more usable in a working model of economic activity. Verbal explanations of the kinds of the market system (reinforced as much as possible by concrete experiences), such as prices, taxes, government, regulation, markets, resources are all understandable.

The vertical and horizontal structures of learning are now more developed so that a number of concepts can be put together to form a functional model for anlaysis.

I would caution, however, that there is still a difference between what a child is capable of learning in this level, versus, in the much more sophisticated level of Socially Relevant/Abstract Formal Knowledge. There is a beginning awareness of the <u>functional usage</u> of economic laws and principles (sets of related concepts forming an economic explanation of behavior), but this does not mean to say that a child is prepared to deal with the more formalized set of economic theories.

An elucidating portrayal of what is being suggested regarding the difference between functional usage and formalized theory can be understood in the following example. It is one thing to say, that generally, there will be a coordination between buyers and sellers in a market so that there will be no shortage or surplus of a product, versus, in a specified time period, under the condition of certeris paribus, Demand [D_X = (P_X, Tastes, Prices of Related Goods, Income, and Future Expectations)], will equal Supply [S_X = (P_X, Technology, Cost of Production, Taxes and Subsidies, Price of Related Goods, Information, Contractual and Policing Cost, Future Expectations)] for

any good, in all market locations. Furthermore, if there are any price differences between geographic location, the price differences will be arbitrated, with the exception of transportation costs.

Other relevant characteristics of the SR/FE level of concept learning include the understanding of both defining and non-defining characteristics of sets of concepts, primarily based on logical and functional usage.

SOCIALLY RELEVANT/ABSTRACT FORMAL

In the Socially Relevant/Abstract Formal (SR/AF) level of concept acquisition the child is entering what Piaget would define at the formal-operations stage of cognitive development. The general and simplified conceptual taxonomy of this level would include the ability and willingness of the pupil to:

> have an interest in checking a 'why' solution: knows that in a system of several variables he must 'hold all other things equal' while investigating one possible variable at at time: formulate abstract relations: use direct and inverse proprotionality for both perceiving and formulating relationships; actively search for an explanatory model or extend one that is given: constructs reference models to explain observed reality and the ability and willingness to shift from the model to reality. Gallagher and Easley (1978, p. 102)

The defining characteristics of this phase, even if kept within the realm of socially relevant knowledge, may be beyond all but the extremely precocious 14- to 15-year-olds. Shapiro and O/Brien (1970) and O'Brien (1972) have indicated that many adults and able university students are unable to function using abstract, hypothetical or theoretical thought patterns.

In order to cognicize at this phase, the learner is required to go beyond the orgnaization of solely concrete features of reality. The constraining assumptions, theoretical abstraction from reality, and hypothetical nature of economics should be presented (though not mathematize) in this phase of concept acquisition.

In general, the learner should have a mastery of language, a relatively efficient strategy for storing and retrieving information, internal motivation for learning, and a working usage of abstract logical thought. These characteristics open the entire discipline of economics to the learner.

EXPERT KNOWLEDGE/ABSTRACT FORMAL

The Expert Knowledge/Abstract Formal level of concept learning is the full embodiment of the economist's understanding of economic concepts. Since this level is beyond the purview of the target population, it is sufficient to say that all other levels of concept learning have occurred, and the continuing abstract, logico-mathematical development of economic inquiry is characteristic of this level.

SUMMARY AND CONCLUSIONS

This paper presents a theoretical model of economic concept learning. It does not follow any strict pyschological approach to defining concept learning; rather, it is a presentation of a generalized model for specific use in economic education.

The model depicts concept learning in economics at successively higher levels, and in a continuum of knowledge categories. It departs from cognitive development theory in the emphasis put on conditions of learning rather than a biological or physical basis for learning. The model also breaks learning down into smaller intervals than generally seen in developmental theory.

The purpose of developing this model was to provide a tentative paradigm for research and teaching in economic education. The future beneficial impact of the model will be its usefulness in providing guidelines for more concept-specific introduction of economic knowledge.

FOOTNOTES

1. "Every beginning student of economics is (or should be) repeatedly warned of the hypothetical nature of the functional relations between variables. There are no 'observable' supply or demand functions - unless one means merely the chalk symbols which the teacher produces on the blackboard for students to observe. All the values of the functions are imagined; the supply function assigns hypothetical quantities offered in the market to hypothetical prices paid, and the demand function assigns the prices and quantities are hypothetical only, they cannot be observed by anybody. (It may be said for the benefit of readers who are comforted by the thought of 'conceivable operationality' that with much fantasy one may design a grant 'experiment', with heroic controls of all relevant factors, to ascertain all values of the functions. But one must add, in all honesty, that the 'operations' required to establish the functions as empirical observations are not practically possible.) The so-called statistical supply and demand curves have not really been 'observed'; they are the result of highly imaginative computations with data recorded at different times under different conditions and manipulated on the basis of unverifiable assumptions which range from 'plausible' to 'contrary to fact.'" (Machlup 1966, p. 63)

2. Although in the Master Curriculum Guide, the inclusion and exclusion of various economic concepts was based on the premise of functional usage for economic decision-making, it does not appear that the difference between chosing a set of functional concepts versus in what depth and breath (level) the concepts should be taught (understood) has been fully resolved.

3. I have no doubt that many of these questions have been dealth with by the classroom teacher. It would seem imperative to "tap-in" to teacher's "hands-on" experience in a more systemized and empirical manner if we are to construct a valid model of economic conceptualizing.

4. One very apparent problem of attempting to use existing research in learning theroy as a guideline for developing a model for teaching economics is the heavy emphasis of research on physical knowledge. I believe the reason for this emphasis is the relative complexity of social concepts (economic concepts) in comparison to physical concepts.

5. Piaget (1971) in a text on epistomology states: The methods of political economy have tended to be brought up to date since three events which occurred between 1925 and 1940; the creation of econometrics (with Schumpeter's manifesto), that of institutions of conjuncture, and Keyne's general theory. All three mark an effort at combination between the mathematical

and experimental spirit, which orients economy in directions quite similar to those of the physical sciences. (Piaget, 1971, p. 142) Bruner (1973) specifically noting the discipline of economics states: . . . it is probably the case that most modern science is moving in the direction of probabilistic-relational concepts, classes of events defined in the terms of the probability that certain attribute values will represent a kind of relation to each other. (Bruner, 1973, p. 138)

6. By verticle learning I mean, that the connecting relations between two or more concepts has not occurred, primarily because of the limited stock of knowledge concerning economic events brought to the learning situation. The connecting "horizontal learning" - the recognition of relations existing between two or more concepts - does not begin to occur (even learning with concrete and perceptable events) until the Formal-Abstract level of learning.

BIBLIOGRAPHY

1. Al-Issa, I. "The Development of Word Definition in Children." Journal of Genetic Psychology, 1969, 114, 25-28.

2. Armento, Beverly J. "Awareness of Economic Knowledge: A Developmental Study." March 1982

_____. "Learning Theory: Implications for Research in Economic Education." Paper prepared for National Symposium, Learning Theory: Implications for Economic Education. July 1982(a).

3. Bransford, John D. Human Cognition: Learning, Understanding and Remembering. Wadsworth Publishing Co., CA, 1979.

4. Brown, G. and C. Desforges. "Piagetian Psychology and Education: Time for Revision." British Journal of Educational Psychology, 1977, 47, 7-17.

5. Bruner, J. "The Course of Cognitive Growth." American Psychologist 1964, 19, 1-15.

6. Bruner, J.S. Beyond the Information Given, Anglim, J.M., ed. W.W. Norton & Co., New York, 1973.

7. Buchanan, J. "Economics and Its Scientific Neighbors." in The Structure of Economic Science. Edited by S.R. Krupp. Prentice-Hall, Inc., New Jersey:1966, 166-183.

8. Case, Robbie. "Learning and Development: A Neo-Piagetian Interpretation." Human Development, 1972, 15, 339-58.

9. _____. "Structures and Strictures: Some Functional Limitations on the Courses of Cognitive Growth.' Cognitive Psychology, 1974, 6, 544-73.

10. _____. "Gearing the Demand of Instruction to the Developmental Capabilities of the Learner." Review of Educational Research, Winter 1975, 45, 1, 59-87.

11. Danzinger, K. "Children's Earliest Conceptions of Economic Relationships(Australia)." Journal of Social Psychology, 1958, 231-40.

12. Ellis, Henry C. Fundamentals of Human Learning and Cognition. Wm. C. Brown Co., Iowa, 1972.

13. Fox, K.F.A. "The Economic Socialization of Children." Unpublished Manuscript, 1977.

14. _____. "The State of Economic World of Children." Unpublished Manuscript, 1977.

15. _____. "What Children Bring to School: TheBeginnings of Economic Education." Social Education, Oct. 1978, 478-81.

16. Furth, H.G. Piaget for Teachers. Prentice-Hall, Inc. New Jersey: 1970.

17. _____. The World of Grown-Ups: Children's Conceptions of Society. Elsevier, New York: 1980.

18. Gagne, R. M. Essentials of Learning for Instruction. Dryden Press, New York: 1975.

19. Gallagher, J. and Easley, J.A., eds. Knowledge and Development: Volume 2 Piaget and Education. Plenum Press, New York: 1978.

20. Gelman, R. "Cognitive Development." Annual Review of Psychology, 1978, 29, 297-332.

21. Ginsburg, H. and S. Opper. Piaget's Theory of Intellectual Development: An Introduction. Prentice-Hall, Inc. New Jersey: 1969.

22. Gorman, R. M. Discovering Piaget: A Guide for Teachers. C. E. Merrill Pub. Co., Ohio: 1972.

23. Hansen, W. Bach, G.L., Calderwood, J.D. and P. Saunders. A Framework for Teaching Economics: Basic Concepts (Part I), Joint Council on Economic Education, New York: 1977.

24. Higgins, J.L. Mathematics Teaching and Learning. C. A. Jones Pub. Co., Ohio: 1973.

25. Innhelder, B. and H. H. Chipman, Eds. Piaget and His School: A Reader in Developmental Psychology. Springer-Verlag. New York: 1976.

26. Issacs, N. A Brief Introduction to Piaget. Schoken Books. New York: 1975.

27. Klausmeier, H. J., Ghatala, E.S. and D. A. Frayer. Conceptual Learning and Development: A Cognitive View. Academic Press, Inc. New York: 1974.

28. Kourilsky, M. "The Kinder Economy: A Case of Kindergarten Pupils Acquisition of Economic Concepts." Elementary School Journal. Jan. 1977, 182-91.

29. Krupp, S.R., Ed. The Structure of Economic Science. Prentice-Hall, Inc. New Jersey: 1966.

30. Lephardt, N.E. "Learning Theory: A Gap in Economic Education." Studies in Economic Education, Center for Economic Education, University of Wisconsin-La Crosse, La Crosse, Wisconsin: 1982.

31. Machlup, F. 'Operationalism and Pure Theory in Economics." in The Structure of Economic Science. Edited by S. R. Krupp. Prentice-Hall, Inc. New Jersey: 1966, 53-67.

32. Marshall, H. R. and L. Magruder. "Relations Between Parent Money Education Practices and Children's Knowledge and Use of Money." Child Development, 31, 1960, 253-84.

33. McKenzie, R.B. "The Economic Literacy of Elementary School Pupils." Elementary School Journal, 71, Oct. 1970, 26-35.

34. _____. "An Exploratory Study of the Economic Understanding of Elementary School Teachers." Journal of Economic Education, 3, Fall 1971, 26-31.

35. Miller, L.N. and T. Horn. "Children's Concepts Regarding Debt." Elementary School Journal, 1955, 406-412.

36. Piaget, J. The Mechanisms of Perception. (Trans by G. N. Seagrim) Basic Books, Inc. New York: 1969.

37. _____. Science of Education and the Psychology of the Child. (Trans. by D. Coltman) Orion Press, New York: 1970.

38. _____. Psychology and Epistemology. (Trans. by A. Rosin) Orion Press, New York: 1971.

39. _____. Success and Understanding. (Trans. by A. J. Pomerans), Harvard Univ. Press, Mass: 1978.

40. _____. Experiments in Contradiction. (Trans by D. Coltman). The Univ. of Chicago Press, Illinois: 1980.

41. Piaget, J. and B. Innhelder. The Child's Perception of Space (Trans. by F. J. Langdon and J. L. Lunzer). Routledge and Kegan Paul, London: 1971.

42. Reed, H.B., and R. D. Dick. "The Learning and Generalization of Abstract and Concerete Concepts." Journal of Verbal Learning and Verbal Behavior, 1968, 7, 486-490.

43. Russell, D.H. and Saadeh, I.Q. "Qualitative Levels in Children's Vocabulary." Journal of Educational Psychology, 1962, 53, 175-180.

44. Saltz, E. The Cognitive Bases of Human Learning. The Dorsey Press, Illinois: 1971.

45. Schuessler, K. and K. Strauss. "A Study of Concept Learning by Scale Analysis." Am. Sociological Review, 1970, 752-62.

46. Schug, M. "The Emergence of Economic Thinking: Implications for Teaching Economics." Unpub. Manu., Dept. of Curriculum and Instruction, University of Wisconsin, Milwaukee, 1980.

47. _____. "What Educational Research Says About the Development of Economic Thinking." Theory and Research in Economic Education, Fall 1981, Vol. 9, 3, 25-36.

48. Schwebel, M. and J. Raph, (eds.) Piaget in the Classroom. Basic Books, Inc. New York: 1973.

49. Siegler, R.S. (ed.) Children's Thinking: What Develops? L. Erlbaum, Assoc., New Jersey: 1978.

50. Strauss, A.L. "The Development and Transformation of Monetary Meanings in the Child." Am. Sociological Review, 17, 1952, 275-86.

51. Sutton, R.S. "Behavior in the Attainment of Economic Concepts: II." Journal of Psychology, 53, 1962, 37-46.

52. Vygotsky, L.S. Thought and Language. MIT Press and J. Wiley and Sons, New York: 1962.

53. Wadsworth, B. J. Piaget for the Classroom Teacher. Longnian, New York: 1978.

54. Wackman, D.B. and Wartella, E. "A Review of Cognitive Development Theory and Research and the Implication for Research in Children's Responses to Television." Communication Research, Vol 4, April 1977, pp. 203-224.

55. Ward, S. et al. How Children Learn to Buy. Beverly Hills: Sage Publications, 1977.

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STUDY NO.

1. L. A. Daellenbach, R. E. Schoenberger and W. E. Wehrs. CAI Materials for Introductory Macroeconomics Course (Volume 1 and 2). Revised. June 1980.

2. W. E. Wehrs. Scoreboard: A Computer-Managed Grading System. December, 1975.

3. L. A. Daellenbach, R. E. Schoenberger and W. E. Wehrs. Has Computer Assisted Instruction(CAI) Been A Financial Failure? October, 1976.

4. L. A. Daellenbach, R. E. Schoenberger and W. E Wehrs. An Evaluation of the Cognitive and Affective Performance of An Integrated Set of CAI Materials in the Principles of Macroeconomics. February, 1977.

5. R. E. Schoenberger. Alternative Approaches to the Teaching of the Concepts of Demand and Supply: Some Illustrations. February, 1978.

6. M. H. Schellenger, R. E. Schoenberger and T. J. Zwirlein. CAI Materials for Introductory Microeconomics Course (Volume 1 and 2). June 1980.

7. L. A. Daellenbach, R. E. Schoenberger. An Evaluation of Computer Assisted Instruction in the Microeconomics Principles Course. September, 1980.

8. L. A. Daellenbach and R. E. Schoenberger. A Note on the Revised Test of Understanding in College Economics. January 1981.

9. N. E. Lephardt. Learning Theory: A Gap in Economic Education. February, 1982.

10. N. E. Lephardt and G. P. Lephardt. A Theoretical Model of Concept Learning in Economics. April, 1983.